

AUG 27 2007

Application No. 10/762,719  
Confirmation No. 5215  
Art Unit 1756, Examiner Sullivan  
Docket No. CL-2287 US NA  
August 27, 2007  
Page No. 2 of 14

**Amendments**

Please amend this application with respect to the matters set forth on separate pages below concerning the written description (beginning on page 2 of this paper), and the claims (beginning on page 5 of this paper):

**In the Written Description:**

Please delete the original of each of the following paragraphs, and replace it with a replacement paragraph as indicated:

Paragraph Number	Paragraph Location in the Written Description			
	Beginning at		Ending at	
	Page	Line	Page	Line
01	2	35	3	15
02	3	16	3	23
03	3	31	4	21

The replacement paragraphs for each of the deleted paragraphs identified above is set forth below on pages 3-4 of this paper in a marked-up version of the original of those paragraphs showing the amendments requested thereto, as required by 37 CFR §1.121(b). In all requested amendments, deletions are shown by strike-through and additions are shown by underlining.

AUG 27 2007

Application No. 10/762,719  
Confirmation No. 5215  
Art Unit 1756, Examiner Sullivan  
Docket No. CL-2287 US NA  
August 27, 2007  
Page No. 3 of 14

**Paragraph 01**

After deposition and patterning of a Polymer A film, a thick film paste formulated with an alkaline soluble binder and organic solvent is deposited over the polymer A pattern. Techniques such as screen printing may be used to apply the thick film paste deposit. After deposition, the resulting thick film paste film is dried at a temperature between 50°C and 100°C for between 15 and 60 minutes. During this drying step, the thick film paste solvent induces dissolution of the patterned polymer A and subsequent diffusion mixing of the polymer A into the thick film paste deposit. The extent of diffusion of the polymer A into the thick film paste deposit during the drying step can be controlled by parameters such as drying temperature and time. It can further ~~by~~ be controlled by the solvent choice for the thick film paste. Since polymer A (e.g. novalac-type photoresists) is insoluble in the alkaline paste developer, its diffusion into the thick film paste during drying renders the diffusion regions of the paste insoluble to alkaline development. A subsequent development step, either alkaline spray or ultrasonic treatment, results in removal of the thick film paste deposit from regions where the polymer A was not present. This novel process is useful in fabrication of electrical and electronic devices comprising deposits of thick film paste.

**Paragraph 02**

The process of the present invention is useful in achieving fine feature patterning of a thick film paste, which by itself has only limited patterning resolution by screen or stencil printing. Photo-patterning of various thick-film pastes are often limited by the solids contents of the pastes, which tend to reduce the optical transparency of some thick film pastes. Binder diffusion transfer patterning provides a simple method of obtaining fine feature patterning of a thick film paste by separating the patterning process from the thick film paste to a second polymeric layer.

Application No. 10/762,719  
Confirmation No. 5215  
Art Unit 1756, Examiner Sullivan  
Docket No. CL-2287 US NA  
August 27, 2007  
Page No. 4 of 14

AUG 27 2007

**Paragraph 03**

As is frequently practiced by those who are skilled in the art, common photo resists such as the DNQ/Novalac and the chemically amplified resist are used for fine feature patterning. Feature size of below 1 micron is routinely achieved. In a DNQ/Novalac type resist, the DNQ, a solubility inhibitor, is decomposed upon exposure to UV radiation rendering the exposed region soluble in a weakly basic developer. In a chemically amplified resist, a photo acid generator is included in the resist formulation. The acid generated upon irradiation can remove a tertiary butyl group from the polymer of the resist. With the butyl group removed, the polymer then becomes soluble in an alkaline or basic developer. The unexposed region of the photo-resist is highly resistant to dissolution in alkaline or basic developer. Additionally, these resists are typically highly soluble in most organic solvents such as ketones, alcohols, esters, ethers, long chain acetates and aromatics. These solvents, including but not limited to texanol and  $\beta$ -terpineol, are also often used to formulate many thick film pastes. For thick film pastes formulated with alkaline soluble binder polymers, a dry paste film can be readily washed off by spraying with an alkaline developer or soaking in the developer while agitated by ultrasonic action. The thick film paste is formulated with a solvent system which will dissolve a paste binder polymer and polymer A. The paste binder polymer is additionally soluble in a development solvent or solution in which polymer A has poor solubility. The paste binder polymer may be, but is not limited to acrylic polymers with carboxyl groups, acrylic polymers with acidic groups, polyvinylalcohol, co-polymers of polyvinylalcohol and polyvinylacetate, and polyhydroxystyrene. By using a novalac-type or a chemically amplified type photo-resist together with an alkaline soluble thick film paste, fine feature patterning of the thick film paste can be achieved by the binder diffusion transfer patterning process disclosed in this invention.